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July 13, 2016

Arthur Burbank
USDA Forest Service
4350 South Cliffs Dr.
Pocatello, ID 83204

Subject: Biological Selenium Removal Treatment Technology
Fluidized Bed Bioreactor Pilot Study
May 2016 Progress Report

Dear Art,

This progress report summarizes key activities in May 2016 associated with the fluidized bed bioreactor (FBR) pilot study located near Hoopes Spring. This pilot study is being conducted as part of the Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) to provide information on the effectiveness of the active biological treatment system in removing selenium and other COPCs from South Fork Sage Creek Springs and Hoopes Spring. Operation and monitoring of the pilot study follows the *Pilot Study Work Plan and Sampling and Analysis Plan (Work Plan/SAP), Biological Selenium Removal Treatment Technology Fluidized Bed Bioreactor* (prepared by Formation Environmental, dated September 2014, with revised text and tables dated March 5, 2015), along with Work Plan/SAP Addenda 01, 02, and 03 which Simplot submitted to the Agencies (and were subsequently approved) in the summer of 2015, and Addendum 04 submitted to and approved by the Agencies in January 2016.

The system was restarted in March 2016 and ran continuously through May 13, when the aeration tank was drained following damage to the aeration diffuser system. The tank was repaired on May 19, and the system was restarted May 20. Due to the system being offline for the week of May 16, Week 7 sampling was delayed by one full week. Week 5 sampling was conducted on May 5 (full analyte list), Week 6 sampling was conducted on May 11 (focused analyte list), and Week 7 sampling was conducted May 25 (full analyte list).

Identification of Deliverables and Data Transmittals

At the time of this report laboratory data for Weeks 5 and 6 have been received (samples collected on May 5 and May 11, 2016). Preliminary laboratory data for the full analyte list are presented in Table 1.1, data for the focused analyte list are presented in Table 1.2, and the field data are presented in Table 2.

There were no outstanding deliverables or transmittals for the month of May.

Upcoming Activities

The following activities associated with the FBR pilot study are planned through June 2016, or have occurred as of the date of this progress report:

- Sampling for Weeks 8 and 9 occurred in the first two weeks of June without any deviations.
- Sampling for Weeks 10, 11, and 12 are scheduled to be completed during the remaining weeks of June.

Please contact me if there are questions regarding this monthly progress report.

Sincerely,

Monty Johnson
Environmental Engineering Manager
J. R. Simplot Company

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Table 1.1
Laboratory Results Full Analyte List

Week 5	Station >>	Influent	Effluent
	Sample ID >>	SC0516-LSSHS-IN001	SC0516-LSSHS-EF001
	Date >>	5/5/2016	5/5/2016
Analyte	**Units**		
General Chemistry			
Ammonia as N	mg/L	0.026 U	1.32
Bicarbonate	mg/L	180	180
Biochemical Oxygen Demand	mg/L	2 U	4
Carbonate	mg/L	1 U	1 U
Chemical Oxygen Demand	mg/L	5 U	5 U
Calcium, Dissolved	mg/L	59.2	58.8
Magnesium, Dissolved	mg/L	21.6	21.6
Potassium, Dissolved	mg/L	0.658	0.681
Sodium, Dissolved	mg/L	5.63	6.39
Chloride	mg/L	8.12	13.9
Fluoride	mg/L	0.265	0.26
Hardness	mg/L	236	235
Nitrate as N	mg/L	0.41	0.03 J
Nitrate/Nitrite as N	mg/L	0.412	0.0309 J
Sulfate as SO4	mg/L	46.4	64
Total Alkalinity	mg/L	180	180
Total Dissolved Solids	mg/L	306	302
Total Organic Carbon	mg/L	0.513 J	0.957 J
Total Phosphorus as P	mg/L	0.0206	0.1
Total Sulfide	mg/L	1 U	1 U
Total Suspended Solids	mg/L	2 U	2 U
Metals and Metalloids			
Aluminum, Dissolved	mg/L	0.0076 U	0.0076 U
Aluminum, Total	mg/L	0.0076 U	0.0076 U
Antimony, Dissolved	mg/L	0.0000732 U	0.0000732 U
Antimony, Total	mg/L	0.0000732 U	0.0000732 U
Arsenic, Dissolved	mg/L	0.000398 U	0.000398 U
Arsenic, Total	mg/L	0.000398 U	0.000398 U
Barium, Dissolved	mg/L	0.0445	0.0312
Barium, Total	mg/L	0.0455	0.0319
Beryllium, Dissolved	mg/L	0.000047 U	0.000047 U
Beryllium, Total	mg/L	0.000047 U	0.000047 U
Boron, Dissolved	mg/L	0.01 J	0.0104 J
Boron, Total	mg/L	0.0108 J	0.0104 J
Cadmium, Dissolved	mg/L	0.0000362 U	0.0000362 U
Cadmium, Total	mg/L	0.0000362 U	0.0000362 U
Chromium, Dissolved	mg/L	0.00052 J	0.0000433 U
Chromium, Total	mg/L	0.00049 J	0.0000433 U
Cobalt, Dissolved	mg/L	0.00005 J	0.00299
Cobalt, Total	mg/L	0.00005 J	0.00296
Copper, Dissolved	mg/L	0.0000418 U	0.00015 J
Copper, Total	mg/L	0.0000418 U	0.00013 J
Iron, Dissolved	mg/L	0.01 U	0.01 U
Iron, Total	mg/L	0.088	0.312
Lead, Dissolved	mg/L	0.0000554 U	0.0000554 U
Lead, Total	mg/L	0.0000554 U	0.0000554 U
Manganese, Dissolved	mg/L	0.00063 J	0.0164
Manganese, Total	mg/L	0.00067 J	0.0166
Mercury, Dissolved	mg/L	0.000004 U	0.000004 U
Mercury, Total	mg/L	0.000155 J	0.000228
Molybdenum, Dissolved	mg/L	0.00221	0.00522
Molybdenum, Total	mg/L	0.00173	0.00535

Week 5	Station >>	Influent	Effluent
	Sample ID >>	SC0516-LSSHS-IN001	SC0516-LSSHS-EF001
	Date >>	5/5/2016	5/5/2016
Analyte	Units		
Nickel, Dissolved	mg/L	0.00045 J	0.00553
Nickel, Total	mg/L	0.00046 J	0.00541
Selenate	mg/L	0.108	0.00005 J
Selenite	mg/L	0.00005 U	0.0087
Selenium, Dissolved	mg/L	0.125	0.0112
Selenium, Total	mg/L	0.127	0.0106
Silver, Dissolved	mg/L	0.0000172 U	0.0000172 U
Silver, Total	mg/L	0.0000172 U	0.0000172 U
Thallium, Dissolved	mg/L	0.0000657 U	0.0000657 U
Thallium, Total	mg/L	0.0000657 U	0.0000657 U
Uranium, Dissolved	mg/L	0.00136	0.00123
Uranium, Total	mg/L	0.00133	0.0012
Vanadium, Dissolved	mg/L	0.00121 J	0.00027 J
Vanadium, Total	mg/L	0.00127 J	0.0003 J
Zinc, Dissolved	mg/L	0.00149 J	0.0036 J
Zinc, Total	mg/L	0.00136 J	0.00357 J

Notes:
Results presented are preliminary, and have not been validated at the time of this report.
U - Analyte not detected above the method detection limit (MDL).
J - Result is estimated.

Table 1.2
Laboratory Results Focused Analyte List

Week 6	Station >>	Influent	Effluent
	Sample ID >>	SC0516-LSSHS-IN002	SC0516-LSSHS-EF002
	Date >>	5/11/2016	5/11/2016
Analyte	**Units**		
General Chemistry			
Nitrate as N	mg/L	0.44	0.13
Total Phosphorus as P	mg/L	0.0321	0.147
Total Sulfide	mg/L	1 U	1 U
Metals and Metalloids			
Selenium, Dissolved	mg/L	0.127	0.00917
Selenium, Total	mg/L	0.124	0.00802

Notes:
Results presented are preliminary, and have not been validated at the time of this report.
U - Analyte not detected above the method detection limit (MDL).
J - Result is estimated.

Table 2
Field Water Quality Data

Week 5	Station >>	Influent	Effluent
	Sample ID >>	SC0516-LSSHS-IN001	SC0516-LSSHS-EF001
	Date >>	5/5/2016	5/5/2016
Analyte	**Units**		
Dissolved Oxygen	mg/L	4.55	3.75
ORP	mV	137	124
pH	SU	7.64	7.4
SC	umhos/cm	1447	459
Temperature	C	12.43	13.81
Turbidity	NTU	0.7	5.5

Week 6	Station >>	Influent	Effluent
	Sample ID >>	SC0516-LSSHS-IN002	SC0516-LSSHS-EF002
	Date >>	5/11/2016	5/11/2016
Analyte	**Units**		
Dissolved Oxygen	mg/L	6.95	6.27
ORP	mV	158	50
pH	SU	7.63	7.31
SC	umhos/cm	455	458
Temperature	C	12.82	12.57
Turbidity	NTU	0.6	11.4